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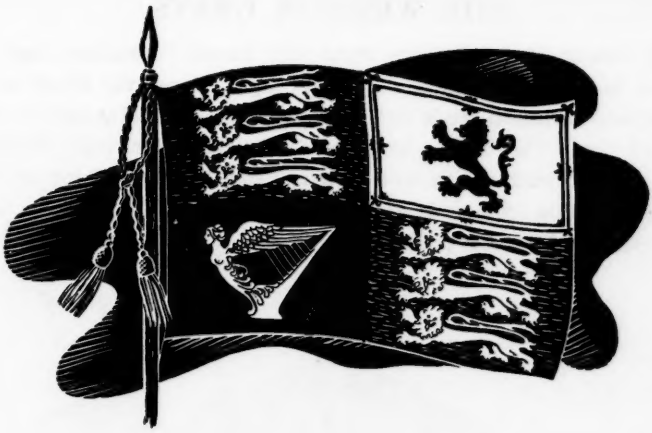
HIS MAJESTY KING GEORGE VI



MAY, 1937

HIS MAJESTY KING GEORGE VI.

THE whole profession will have read with pleasure the wording of the message which was sent to the Council of the Royal College of Veterinary Surgeons stating that His Majesty King George VI had graciously consented to become our Patron; and this, combined with the fact that the same honour had been granted to the Royal Veterinary College, is further evidence of the interest which he takes in our work, and which he—and indeed every member of the Royal Family—has always taken in the welfare of animals.

Such consent is never lightly given, and the King's Patronage implies a responsibility to be lived up to, but one which our President and Council gladly accept and undertake. Fond of his horses and dogs, nothing gives His Majesty greater pleasure than to have leisure to be with them; and whether it is hacking, or riding his favourite hunter, or when accompanied by his shooting dogs, the place they take in his affections bodes well for the profession which he has so graciously honoured.

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THE WINDSOR GREYS.

THE honour of drawing the world-wide known Coronation Coach is to be given to this famous team. There are eight horses, the oldest of which, "Greystone," seventeen hands high, is now nineteen, and still as eager in his work as any of them. They will be ridden postilion. The harness which they carry is of red morocco leather with ornamentations of gold plate and copper, and has no joins, each side being made from a single hide. It is so heavy that two men are necessary to lift it into position.

THE ROYAL MEWS.

Now that the Royal Mews at Windsor has been closed, the horses of His Majesty the King are, with a few exceptions, stabled in the Royal Mews attached to Buckingham Palace. Here are to be found some eighty horses altogether, including certain of the hacks and chargers for use on ceremonial occasions, and some sixty carriage horses. Amongst these are the celebrated Cleveland Bays, which were bred at the Hampton Court stud, and the famous Windsor Greys which will take their Majesties to Westminster Abbey on the twelfth of May. Included amongst the hacks is the twenty-six-year-old mare "Brownie," which was the late King George's favourite charger for all ceremonial parades after the death of the Australian horse "Anzac."

The stables are very lofty and well lighted, and may be seen, together with the State carriages, by permission, which is readily granted upon request.

The famous Windsor Greys, which will draw the Coronation Coach in the Procession, being exercised in the Mall.

THE SHORTAGE OF VETERINARY SURGEONS.

For some considerable time veterinary practitioners in this country have been loud in their complaints of inability to obtain assistants and *locum tenens*; and if confirmative evidence of this is needed one has only to glance at the advertisement columns of our weekly contemporary, *The Veterinary Record*, to see the disproportion between the lengthy list of demands for helpers and the brevity of that of the extremely few who are asking for employment.

Particulars of whole-time posts, too, are to be found with almost unfailing regularity, and some of these scarcely evince replies. In one instance recently, in which the initial amount of a definitely progressive salary in Great Britain was £400, there were no suitable applicants; and a £600 position abroad has recently met with the same fate. All healthy signs of evidence of the undercrowding of the profession, but alarming when considering the future of the health of animals and its relation to Agriculture. The latter will have to awaken one day soon and seriously consider this shortage, for disease germs have no mercy, and epidemics break out amongst animals as virulently as they do amongst men; and there are quite large areas of Great Britain where it is no easy task to obtain qualified veterinary help. Plenty of illness, and work to be done, but the difficulty in collecting fees makes it impossible for a professional man to live, and for such districts it is safe to prophesy an eventual panel system on appropriately similar lines to that in use in human medicine.

An editorial annotation in our contemporary, *The Lancet*, recently drew attention to this same subject, emphasising it from another point of view—that of the position which the members of the veterinary profession hold as collaborators with members of the human medical profession in the guardianship of the Public Health.

After calling attention and giving due credit to the part played by the Veterinary Department of the Ministry of Agriculture in the complete eradication of such animal diseases as glanders and rabies, and expressing the hope that these terrible menaces to man will never again obtain a foothold in this country, the article proceeds to state that "this security depends upon the continuance of the present keen veterinary inspection at each port where animals are allowed to land, as well as our quarantine laws and those governing the importation of animal products."

Touching upon the question of the meat and milk supply, the Editor emphasises that "in the inspection of meat for human food the man who, by virtue of his training, knows most about the matter is the veterinary surgeon. He is the one best qualified to detect disease in the food animal before slaughter and to guarantee the soundness of the flesh when dressed for human consumption. And in the present fight against tuberculosis, which is an uppermost theme in every mind, the medical man works with the veterinarian; and only through

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such collaboration can measures of prevention be considered, or a successful conclusion be anticipated. . . . If an intensified effort to eradicate the tuberculous cow is a great task before the veterinarian, we are reminded how varied and important are the other directions in which his services are required in the promotion and protection of the public health. The shortage of qualified veterinary surgeons is therefore a matter of real concern."

Still further openings will be in evidence shortly if the Livestock Industry Bill passes its final reading, as there is attached the Minister's scheme for the establishment of at least three public abattoirs—and these will most certainly need veterinary officials and meat inspectors, positions of authority and great responsibility, and impossible to be occupied efficiently by any other than qualified veterinary surgeons. As stated by our medical contemporary: "In the inspection of meat for human food the man who must by nature of his training know most about the matter is the veterinary surgeon." In all Continental countries there is never any thought otherwise; and Scotland, always ahead in matters of hygiene and education, has already fallen into line. Why England lags behind in matters of such importance is beyond comprehension! In Germany, Holland, Sweden, Denmark, Italy—to mention only a few of our Continental neighbours—every city and country district has its public abattoir, all under veterinary supervision, and as an illustration of the thoroughness with which this is carried out, one needs only to mention a city like Berlin, where no less than fifty whole-time veterinary officials are employed on this meat inspection duty alone. It is for those who control our veterinary education to see that due and proper facilities are insisted upon in our Colleges for efficient teaching in this important and ever-growing subject of meat and milk inspection, so that we may not be found unready when the opportunity comes forward for our help to be given.

General Articles

VETERINARY EDUCATION IN SOUTH AFRICA.

By Dr. J. I. QUIN

Professor of Physiology in the Faculty of Veterinary Science, University of Pretoria.

As a result of the efforts made mainly by the late Sir Arnold Theiler, a Faculty of Veterinary Science was established in 1920, first under the auspices of the Transvaal University College, Pretoria, which later on became the University of Pretoria. Up to the present this has been the only centre for veterinary training in Southern Africa. Since the inception of this faculty a full five years' course has been adhered to, only matriculated candidates being accepted. The first year of the course may be taken at any of the South African Universities, and comprises the four science subjects—chemistry, zoology, botany and physics—while the remaining four years have to be taken at Onderstepoort, ten miles from the University of Pretoria, where the Government Veterinary Research Laboratories are situated. For the purposes of the course special class-rooms and laboratories have been erected, although much of the work is done in conjunction with the research problems under investigation. The teaching staff, with the University status of either professors or lecturers, are, however, appointed on a part-time basis with an extra remuneration of £100–£200 per annum. The original appointment in each case is that of research officer in the Department of Agriculture. Successful completion of the course is followed by the granting of the degree Bachelor of Veterinary Science (B.V.Sc.) by the University of Pretoria.

Teaching Staff.—The present Dean of the Faculty and Director of Veterinary Services and Animal Industry is Dr. P. J. du Toit, who is assisted by a teaching staff of eleven professors and eleven lecturers, of whom twenty are veterinarians.

Veterinary Course.—The course in veterinary science as given at Onderstepoort comprises twenty-five subjects falling under fifteen independent departments, the length of the courses varying from one to four semesters. Time tables are arranged on the basis of forty periods (forty-five minutes each) per week.

Buildings, Equipment, etc.—Apart from the various departments already accommodated in specially equipped buildings, several more large laboratories are either in the course of construction or about to be undertaken in the near future. These include a meat research and refrigerator building and a medical clinic. A well-equipped scientific library is at the disposal of both staff and students.

Veterinary Graduates.—During the thirteen years that students have been graduating from this Faculty, eighty-two have up to the present obtained the degree of B.V.Sc. Of this number, all but one have been men graduating on an

average of six years. Students are drawn from all parts of Southern Africa and special hostel accommodation is provided for them at Onderstepoort.

Veterinary Profession in South Africa.—Up to the present by far the largest number of qualified veterinarians in South Africa have been taken up in the Union Government Service either as field or as research veterinary officers, whereas a smaller number have either gone into private practice or have found employment in municipal service.

VETERINARY SERVICES IN NEW ZEALAND: THE POSITION AND OUTLOOK.

By A. L. THOMPSON, M.R.C.V.S.

Late Veterinary Service, New Zealand Government.

VETERINARY services in New Zealand come under three headings: (*a*) Government Service; (*b*) Veterinary Clubs; (*c*) Private Practice.

Before proceeding to consider these three groups, a few general details concerning the country as a whole may help towards a better understanding of later remarks. In size, New Zealand approximates the total area of England, Ireland, Scotland and Wales. It consists of two main islands—North and South—with the very much smaller Stewart Island which lies to the south of the South Island. The total population of New Zealand is about one and a-half million people, of which nearly two-thirds live in the North Island.

The approximate animal population is as follows: Sheep, 30,000,000; dairy cattle, 2,000,000; pigs, 808,000; horses, 250,000; dry cattle, 2,250,000; dogs, 250,000 (estimated).

By far the greater proportion of the dairy industry is located in the North Island, while the greater percentage of sheep is located in the South Island. The natural and correct assumption from this is that the greater percentage of veterinary surgeons in New Zealand is also located in the North Island. This, however, is chiefly accounted for by the requirements of the Government services, the private practitioners being fairly equally distributed in both North and South Islands.

Government Veterinary Service.

The livestock division is the most important of the four divisions comprising the Department of Agriculture, and it includes the veterinary services. The director of the division is a veterinary surgeon, and his four district superintendents are also veterinary surgeons. There are two district superintendents in each island. The district superintendent controls the activities of the various field veterinarians and veterinarians located in meat export slaughterhouses in his district. He also controls the lay stock and meat inspectors.

In all, about thirty-six veterinary surgeons are employed by the Government, and this number includes the Director, four District Superintendents, and the staff

of the Veterinary Laboratory. The rates of pay are as follow: Director, £700 per annum; District Superintendent, £655 per annum; veterinarians, £470 to £600 per annum. Most of the appointments are made in England, and successful applicants receive a first-class passage to New Zealand.

What are the prospects? Naturally, the only channels of promotion are the posts of District Superintendent, or Director. Consequently promotion is very slow indeed, the smallness of the service limiting the channels available. The commencing salary at present is £470 per annum, rising by one annual increment of £20 and two of £25 each to £540, or, if the veterinarian is engaged principally in field work, by two further increments of £25 each and one of £10 to £600. This is the present maximum salary.

It must be pointed out, however, that New Zealand, being entirely dependent on agricultural products for its national income, is at once affected by world economic crises. Consequently Governmental economies designed to meet decreased national income usually take the form of reductions in the salary of the Civil Service. Government veterinarians encountered a 20 per cent. reduction in salary during the period of the slump recently ended.

Income tax, payable on £600 by a married man with no family, amounts to about £20 per annum. In addition to this, there is an unemployment tax of tenpence in the pound, amounting to a further £25 per annum. Subscriptions to the Superannuation Fund are obligatory, and the rate paid depends on the age of the person when joining the service.

New Zealand currency has been depreciated by 25 per cent., so that the New Zealand pound is worth only fifteen shillings in England, and, conversely, the pound sterling is worth twenty-five shillings in New Zealand. Therefore, the cost of living in New Zealand is considerably higher as compared with England, since the 25 per cent. Exchange and 5 per cent. Sales Tax have to be paid on goods imported into New Zealand. A single item—meat—is the only article which is cheaper than in England. Even though the higher rate of income taxation in England tends to cancel out the difference, the cost of living in New Zealand still remains higher than in England, particularly for the professional man.

Thus, to sum up, the New Zealand Government Veterinary Service offers the veterinary surgeon a steady but very limited income. The duties are of a widely diverse nature, and consequently are never monotonous, and the climate is congenial.

Veterinary Clubs.

Outside the Government Veterinary Service one of the sources of employment in New Zealand for the veterinary surgeon is the Veterinary Club. These usually consist of groups of farmers, paying at a certain rate annually into a central fund. A veterinary surgeon is employed, and his salary is paid out of this fund. His duties consist of general practice and attending to the sick animals of the subscribers. The usual rate of pay offered is from £500 to £600 per annum, with a motor car allowance subject to arrangement between the parties.

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Under this heading may be included Dairy Factory Companies, who sometimes employ a veterinary surgeon, paying him about £500 to £600 per annum to look after the health of their suppliers' animals. In many cases a reasonable fee is charged for the first visit, to keep frivolous calls in check, but such fees, when collected, have to be paid into the central salary fund.

From these few remarks it will be obvious that this form of veterinary employment in New Zealand offers few prospects, if any. Its only recommendations are that there is no account collecting and there are no bad debts. The experience in the past has been that, with one or two exceptions, these clubs are unstable, and naturally they have been adversely affected by slumps.

Private Practice.

It can be said at once that with half a dozen exceptions, private veterinary practice has not proved to be a successful undertaking in New Zealand; but in fairness, it must be added that with the exception of the areas in which these six practices are located, private veterinary practice has not been given a consistent trial.

The qualified men who have undertaken veterinary practice in places outside these areas have been few in number, and their attempts have been erratic and of short duration. Consequently, the position in New Zealand with regard to private practice is to some extent an unknown quantity. The fact that success has attended persistent efforts in certain areas appears to indicate a similar possibility for the untried areas.

As the farming industry in New Zealand developed—there being no corresponding degree of development in veterinary services—the individual farmer was thrown back on his own resources in so far as the treatment of sick and injured animals was concerned. The only veterinary aid available to him was that received in a general way through lectures, pamphlets and demonstrations given at intervals by officers of the Government Veterinary Service.

It can be well imagined therefore that New Zealand for a time was a happy hunting-ground for thousands of quacks and vendors of nostrums and patent remedies. With the passing of the Veterinary Surgeons Registration Bill the number of unqualified men working under high-sounding designations was very considerably reduced. Quite a few are still operating without any title, however, and consequently do not come within the prohibitory clauses of the Act.

The farmer's lack of opportunity to compare his experience of the quack's services with those he could receive from the qualified practitioner caused him to broadly classify under one heading everyone who, legitimately or otherwise, used a veterinary title. That this classification was not a favourable one will be realised when it is known that various patent remedy vendors and other types of mendicants, when arrested by the police for some misdemeanour, almost invariably described themselves as "veterinary surgeons." This state of affairs does not exist to the same extent nowadays, and the reputation of the profession is

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steadily improving. The position in regard to patent remedy hawking reached such a pitch that the New Zealand Farmers' Union appealed to the Government for protection. This resulted in the Stock Remedies Bill (which was prepared by the New Zealand Veterinary Association) being placed on the statute book.

Thus legislation is in existence for the protection of the qualified practitioner in two important directions. In addition to this, farming practice has reached such a degree of intensity—the quality of the producing animals has improved to such an extent—that the farming community is sorely in need of the assistance of veterinary practitioners. This is now widely recognised, and appeals have been made to the Government to remedy the position. In view of these improvements in the position, the prospects of successful private veterinary practice in New Zealand may be considered favourable, even though the country from this point of view is largely virgin ground.

THE VETERINARY SURGEON IN PRIVATE TOWN PRACTICE.

By G. MAYALL, M.R.C.V.S.

THE veterinary surgeon who has had a town practice during the last twenty years will have seen some remarkable changes in the scope and amount of his work, and if he has been occupied in his profession in a private capacity for forty years he will hardly recognise the high lights and palmy days of the nineties and the pre-war period of the 1900's.

A gradual squeezing and contraction and alteration of the old spheres of work have taken place, and the gentlemen's carriage-horses and genial grooms and coachmen of past days are now conspicuous by their absence. The long and noble high road that led out of the town bordered by mansions with carriage drives and picturesque gates, out of which sleek and handsome horses emerged drawing broughams and landaus taking my lady or the master of the house out on their various quests, do not exist to-day. A great and good source of permanent income for the town veterinary surgeon has passed with them. The passing is to be regretted, as it had far more romance and poetry about it than the polished machine with its eternal horn that exists to-day. It provided a livelihood for many types of cheery humanity that one does not notice so often on account of the strained and highly-strung individuals that exist in these times of hurry and scurry.

The big livery yards full of the smart hackneys of the farmer, the squire and the master of the hunt, which resounded to the chaff and laughter of the country folk and the witticisms of the presiding ostler, are now extinct. And what of the industrial side of practice? The big breweries have mostly lessened their

number of horses, the cotton mills show preference for motor lorries ; and the small carrier, the grocer, the job masters and funeral proprietors all lean towards mechanical transport. Consequently the town veterinary surgeon closes down his big yard full of stalls and loose boxes and goes into private residence. Keeping up big establishments and paying rent and rates for empty buildings are not paying propositions these days. The little man with three or four horses formerly, now gets a motor lorry and does not support the veterinary surgeon by leaving an ailing horse with him to restore to health and usefulness. The present mainstays of horse practice in the towns, especially in those surrounded by an agricultural district, are concerned with horses that deliver milk, railway horses, those of co-operative societies, collieries, corporations, and a few breweries and corn merchants. Canine and feline practice have increased enormously, and pets of varied kinds furnish some kudos.

It is well for the town man, who will find more time on his hands than he used to have, to make all the friends he can, choosing them judiciously, to take some interest in sport and recreation, and to carry on some kind of physical exercise, even to a late period in life. The contacts he will make will often increase his *clientèle*.

Book-keeping (a weak spot in recent graduates) is very essential, and, despite what is said or written to the contrary, it always pays to have the books of the practice audited annually. A living can still be made in town practice if well-conducted practices have been or are purchased, but the days when veterinary surgeons died and left ten, twenty or thirty thousand pounds have mostly faded into the limbo of forgotten things.

AN EVENTFUL YEAR IN THE LIFE OF A HORSE.

By R. ISHERWOOD, M.R.C.V.S.

Liverpool University.

THE subject was a bay cart gelding, five years old, seventeen hands, star, race, snip, off-fore coronet and heel white, both hind white ; purchased in December, 1935, at a well-known sale yard for sixty guineas, and warranted to be sound. A careful examination certainly confirmed this, and the animal was in every way attractive, appealing both to the veterinary surgeon who examined him and the purchaser.

His bodily condition was such as one would expect in a horse which is meant to look well in the show ring ; that is to say, in hard-working condition, although more than a little inclined to fat. His working life commenced the next day, starting in a mild way the conditions which it was hoped he would follow under more strenuous circumstances for a considerable number of years.

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For at least a month he gave promise of fulfilling this hope, and at the end of this time he had lost much of his round appearance, but it was apparent that he was making muscle very nicely. He worked well, fed well, and rested well. On the face of it, nothing more could have been expected ; but it was noticed that two small swellings had appeared on each side of the withers, just behind the top of the collar. It was then thought that the skin in this region had been pinched owing to the loss of fat, the collar with which it was originally fitted becoming too large as a consequence. The swellings, one on each side, were about two inches in diameter, palpably contained fluid, and were quite painless. A new collar was fitted and the horse returned to work at once. He was not seen professionally for about another month. In the meantime he had worked well, and the only cause for complaint was that the swellings had grown larger.

It was evident now that they were not simple hæmatomata, as had at first been suggested. The swelling on the near side was about as large as two hands placed side by side and much the same shape. It was rather flat and fluid-containing, and its direction was downwards and forwards. The swelling on the other side was circular, about three inches in diameter, and it was not so flat as the one on the near side. In neither case was there any breaking of skin, interference by the collar, or any evidence of pain. Diagnosis had of necessity to be reconsidered. The case seemed clearly to come within the scope of so-called fistulous withers, and it was apparent that treatment would have to be undertaken accordingly.

At this time there was a good deal of controversy as to the causation of this condition. One could choose between injury and death of tissue, infestation with the filaria worm *Onchocerca cervicalis*, or infection with the organism *Brucella abortus*. It was also possible to mix these in any proportion. In view of the freedom from pain and the absence of any lesion opening to the exterior, injury followed by necrosis seemed unlikely. Any investigation into the question of the presence or absence of the worm could not be pursued, and so it was decided to obtain evidence, if any, of the existence of an infection with *Brucella abortus*.

A sample of the fluid from the swellings was therefore taken under sterile conditions, and submitted for examination to the Department of Veterinary Pathology of the University, which reported later that it had not been found possible to grow any culture, but that the material was rich in agglutinins of *Brucella abortus*. A further supply of material provided a similar result. Also a sample of blood taken from the jugular vein was shown to be very poor in agglutinating powers.

In the meantime the horse had been worked regularly, but showed a disconcerting tendency to grow swellings on the slightest provocation. He had bumped his knee (off side), and it was swollen. There was no pain on palpation, and he was not lame. Also the appearance of the right scrotal region had caused a veterinary practitioner to inquire if he was " clean cut."

As it had been found impossible to prepare an autogenous vaccine, it was

decided to use one obtained from similar cases which had occurred in a stable in Liverpool. This was made available by the Department of Veterinary Pathology of the University. It was decided to remove as much fluid as possible by means of a trocar and cannula. This was done. It was a sticky, yellow, clear fluid containing a considerable amount of fibrinous material. Three cubic centimetres of vaccine were injected subcutaneously at the left side of the neck. After twenty-four hours there was a swelling at the site of injection about three inches in diameter. There was no noticeable general reaction, the temperature remaining normal, and the animal being of good spirits and appetite.

The horse was seen again after an interval of a week. In the meantime he had continued at work. The operation wounds in both swellings had healed almost at once, and a further filling had occurred, but it was not to the previous extent. A second injection of three cubic centimetres of vaccine was given on the right side of the neck with a result similar to that of the first injection, except that the temperature was noted to be one degree higher after twenty-four hours than it had been at the time of injection.

In order to suit the convenience of the owners, it was decided that for the time it should be routine to visit the horse at week ends, and any further injections should be given then. In this way there would be no interference with work. After a further three injections of four cubic centimetres of vaccine the swellings were very much reduced. Indeed, a casual observer would not have noticed them at all, and the owner was full of confidence that it was now only a matter of a short time, and that further attendance was unnecessary. He consented, however, to the animal's receiving the remainder of the vaccine, which amounted to about five cubic centimetres, but only on the ground that it would be a pity to waste it.

The horse was not visited professionally until mid-way in July, when it was reported to be lame. The record showed that it had worked regularly and well up to this time. Examination showed that he had fallen away in condition and that the swellings were again very much in evidence ; although they were neither so large nor so tense as they had been before treatment was undertaken. It was evident that the *Brucella abortus* infection was not yet defeated. On being removed from the stable a comparatively slight lameness in the near foreleg was apparent. Examination of the limb revealed heat, swelling, and tenderness affecting the front of the pastern. The shoe was removed and the foot carefully inspected, but nothing abnormal was detected. History revealed that the lameness had commenced four days previously. No information in respect of possible accidental damage could be elicited. It was decided to treat the inflamed area with cold applications.

One week later the horse was very lame indeed, and split pastern was now seriously considered, although the history of the case and the course so far did not really suggest this. The swelling in the pastern region was now very pronounced, hot, painful and hard. The horse was slung, as he could bear no weight

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on this leg, and it was feared that he might cause further damage in going down and getting up. Cold compresses were applied to the affected part.

The veterinary attendant was not at all happy about this case ; both from the point of view of prognosis, which on the face of it appeared very bad, and because he felt that he did not understand quite what was going on. The severity of the present condition had distracted his attention from the wither swellings, which it had been his intention to treat during the horse's enforced idleness. But in any case there would have been some delay, as at this time no *Brucella abortus* vaccine from horse cases was available.

He now began to associate in his mind the present lameness with the other pathological manifestations, which seemed to be rather more prominent than they had been about a week previously. He therefore decided to use a vaccine of direct bovine origin, as this could be obtained immediately ; and before leaving the district he injected seven cubic centimetres of this vaccine. The case was then handed over to a neighbouring practitioner in a truly unsatisfactory state. On his return a fortnight later it came as a pleasant surprise to hear that the horse was very much improved. Apparently it had appeared to be worse for the first five days after the injection, and the owners had expressed the view that on humane grounds it should be destroyed. But on the sixth day there had been a rather dramatic improvement. The horse was happier, was feeding well, and bore some weight on the affected leg. And the only treatment which had been applied had been palliative.

The horse was now seen by his regular veterinary attendant, and he noticed at once that the wither swellings were very much reduced. The horse had been removed from the slings for three days, and the marks on the body showed that he was lying down on the off side. He was removed from the stall without any difficulty, and it was seen that when he walked forward that he was not lame, except for a slight limp on turning. The swelling in the pastern region was neither painful nor hot.

With this encouragement, it was decided to pursue the vaccine treatment, and five cubic centimetres were administered weekly for the next three weeks. At the end of this time the wither swellings had disappeared entirely, the horse was improving in condition, and was not lame at all. He was gradually put to work, and at the end of the year was giving satisfactory service. And so concluded a very trying year in the life of this horse.

The account ends as an acceptable story should, *viz.*, with a happy ending, especially when at one stage in the narrative this seemed unlikely. Analysed, there seems to be a mixture of fact and speculation. The former consists of the positive information obtained from the agglutination tests, and the latter of the association of the *Brucella abortus* infection with the excessive lameness. But it is difficult not to connect these in our thoughts when faced with the dramatic recovery which resulted on an attack on this organism and this organism alone.

GRANULOMA IN BOVINES.

By Lt.-Col. T. DUNLOP YOUNG, O.B.E., M.R.C.V.S., D.V.S.M.
Charterhouse Chambers, Smithfield, London, E.C.

VETERINARY meat inspectors find, from time to time, peculiar nodules in various parts of beef carcases, most commonly in the subcutaneous musculature of the coccygeal and leg regions. The nodules vary in size from that of a pea to that of a walnut. A description, with plates, is given in Ostertag's latest " Handbook on Meat Inspection," pages 198–199, under the title " Roeckl's Granules."

These nodules were first observed by Degive and Van Hertsen in 1870, but Roeckl (1885) was the first to study the condition carefully. Since then they have been studied by Hertwig, Rasmussen, Dürbeck, Hanozet, Foulerton, Schwaebel, Hungerbuhler, Perard and Ramon, Meissner, Crohn, Zwart and Frenkel Vago, Besana, Grüttner, Burghoffer, Lachenschmidt, Hora, Van Heelsbergen and Clarenburg, Buitenhuis, Junack, McFadyean and Gaiger ; lately Verge, Tachon and Drieux have further studied these nodules and published the result of their investigations. They found the nodules in various parts of the bodies, *viz.*, subcutaneous tissue, lungs, liver, testicles, epididymus, tunica-vaginalis, lymph glands, and in the musculature of the shoulder, breast, back, croup, tail and metatarsus.

As these lesions have been found in carcases which showed definite lesions of tuberculosis, meat inspectors have often considered them as tuberculous, without, perhaps, sufficiently verifying their opinions. On the other hand, nodules of this nature are commonly found in beef carcases in which no evidence of tuberculosis exists. The carcases are generally well nourished, with no hyperæmia existing around the lesions, being similar to sarcocysts in that respect ; the nodules are firmly adherent to the surrounding tissues ; in the centre of some of them a degeneration is apparent, being caseous or caseo-calcareous. On section they are fibro-lardaceous, in colour they are grey or slightly yellowish-grey, and resemble, as some research workers state, lesions caused by *C. pyogenes*.

Verge and his colleagues made special examination of several carcases in which such nodules were found associated with lesions of tuberculosis. These examinations consisted of bacteriological, histological and inoculative observations.

Rabbits and guinea-pigs were inoculated with material obtained from the apparent tuberculous lesions, resulting in the death of the animals in thirty to fifty days, while those inoculated subcutaneously and intravenously with material from the nodules were unaffected during six months' observations. These results agree with the observations of Ostertag, also McFadyean and Gaiger working on lesions supplied by the writer. In addition to tuberculosis, various theories have been suggested as the cause, *e.g.*, fibro-sarcoma, fibromata, sarcosporidia, blastomycosis, streptococci and pyobacilli.

Acid-fast bacilli have frequently been observed in the nodules, but it is interesting to note that, according to Day, Roach and Hastings, the bacilli were

not pathogenic to laboratory animals and cultures were not obtained on the usual media.

Three hypotheses as to the ætiology of these interesting nodules have lately been submitted: (*a*) Tuberculosis due to an attenuated bovine type inoculated subcutaneously (Day, Carpenter and Goldberg, Watson). A type non-pathogenic, or rarely so, to laboratory animals (Mitchell, Feldman). (*b*) Streptothrix or the Preisz-Nocard bacilli (Traum, Daynes and Austin). (*c*) Some saprophytic acid-fast bacilli which can live under the skin (Traum, Hastings, Beach and Weber, Crawford).

Verge and his colleagues conclude the granuloma of Roeckl form a condition comparatively rare and special to bovines, characterised by the presence of nodules chiefly in the superficial muscles and subcutaneous cellular tissue, occasionally with other alterations, particularly those of tuberculosis in the viscera or serous membranes.

Obscurity as to the exact ætiology still exists, although suspicion as to tubercle bacilli is prevalent. Parasitism cannot be overlooked, according to some research workers, neither can blastomycosis. So far as meat inspectors are concerned it is only necessary to reject the parts in which the nodules are observed.

LARGE-SCALE TESTING OF FOWL'S BLOOD FOR THE PRESENCE OF *S. PULLORUM* INFECTION.

By H. P. HAMILTON, B.V.Sc. (Tor.)

Director of the Poultry Pathological Research Laboratory, Goring, Reading.

DURING the course of the last seven years this laboratory has been engaged on large-scale testing of blood samples for *S. pullorum* infection, receiving the material from upwards of 15,000 different farms. It is thought that some account of the *modus operandi* might be of interest to those similarly engaged, and the purpose of these notes is to show the actual process in vogue at this institution. During the summer, blood tubes to the number of over one million are cleaned, polished, corked, numbered and packed in special travelling boxes, which boxes are line with " Ten-Test " for the double purpose of controlling the temperature and protecting the tubes against the risk of the postal and rail transit.

Tubes are packed in boxes containing 30, 80 and 100 tubes, each box being fitted with a bottle of methylated spirit with rubber vaccine cap, for the purpose of disinfecting the needle, and also a curved needle for puncturing the vein. When the tubes are returned with the blood from the poultry farmer they are unpacked from their travelling boxes, registered and recorded. They are then passed to the test room for the operation of testing as delineated below.

Antigen.—It has long been recognised that the quality and standard of antigen used is of vital importance when assessing the value and accuracy of the test. In this laboratory we have 240 strains of *S. pullorum* which are transplanted

monthly and tested for agglutinability, growth and type. Twenty of the most suitable strains are selected for the production of antigen. The usual method of preparing the medium is adopted, the cultures being seeded in to Roux flasks and incubated for twenty-four hours after the preliminary sterilisation test has proved the absence of contamination. The growth is washed off with normal saline plus 2 per cent. phenol ; 160 c.c. of concentrated antigen, with a count of approximately 12,000 million per c.c. being obtained. This concentrated antigen is stored in Winchesters and diluted to a count of 1,200 million per c.c.,corresponding to tube No. 1 of the Wellcome scale. The dilutant is normal saline to which has been added 2 drs. per litre of NaOH (N/1). Each Winchester of the final product is tested with control sera before being sent to the test room.

On arrival at the test room the antigen is filled by an automatic filler into test tubes (3 in. by $\frac{3}{8}$ in.) mounted in racks of ten tubes.

Accuracy Control.—During the years 1933 and 1934 a double test with a dilution of 1 : 25 was used in order to close up the possibility of human error. These tests were entirely independent and carried out in different rooms. The variations were found to be negligible and the practice was discontinued. Another means of accuracy control has been instituted which consists in testing a number of racks of blood through to their conclusion, and then putting them through again the next day under another number and comparing the result. This control method is practised daily, and on no occasion last year (1936) was there a single variation. This control method will be continued, for it must be realised that with upwards of 25,000 tests being received in one day at the busy time of the year the chance of human error creeping in must, as far as possible, be avoided.

Serum/Antigen Dilution.—The dilution of serum to antigen used in this laboratory is 1 : 25. The serum is added to the antigen by means of a special micro-pipette which can be set to draw up the required amount of serum, *viz.*, 0.04 c.c. These pipettes are checked hourly by the test-room manager. When set they are incapable of receiving more or less than the required quantity. They are rinsed between each test in a solution of normal saline. Each tester is allowed fifteen minutes to test 100 samples, and therefore, with adequate rest between each rack, about 350 tests are carried out hourly by each assistant. An eight-hour day is practised, and when in full operation a staff of ten testers are working, thereby getting the task done in good time and without undue hurry.

On the arrival of each Winchester of antigen from the bacteriological laboratory a sample is tested against known positive and negative sera, and such control is placed with the samples for incubation. As soon as the work is finished for the day the antigens are placed in the hot rooms until 9 a.m. the following day. These rooms hold 30,000 tests each, one room being kept in reserve. They are insulated with 4 in. of cork and ventilated. The racks in which the antigen tubes are packed are themselves made of perforated zinc to ensure an adequate circulation of air between the tubes. The rooms are heated by electricity with a

thermostat cutting out at 98.4° F. By means of a special mechanism, should the cut-out not work at 98.4° F., the electricity is automatically disconnected and a red light glows outside the room. The electrical installation was supplied by Messrs. Chas. Hearson, Ltd., and has proved to be highly satisfactory.

At 9 a.m. the following morning the control tests are examined, and if reactions are noted according to sera added the tests are read and recorded.

Our system of recording and reporting enables us to get the results posted by 1 p.m. on the day following the receipt of the samples. The table appended herwith gives details of the number of monthly tests carried out at this laboratory during the years 1934 to 1936 inclusive.

It will be observed from this table that the total tests carried out in 1935 were less than the number carried out in 1934. This can be explained by the action of some of the larger hatcheries adopting the so-called "antigen," "rapid" or "slide" test doing the work themselves on the farms from which they buy eggs. This laboratory has been repeatedly asked to supply antigen for this rapid test, but it has persistently refused, not believing that the widespread use of this test is in the best interests of the poultry industry as a whole. The use of this test will only cease when the industry arrives at that state of education which demands to see the *result* of the test rather than relying on the published words "blood tested stock," which is the common form of advertisement among breeders.

	1934			1935			1936			Average monthly
	Total	+	%+	Total	+	%+	Total	+	%+	%+
Jan.	169,796	8,811	5.17	147,817	7,650	5.17	113,958	4,778	4.19	4.84
Feb.	61,418	4,074	6.63	51,690	3,226	6.24	44,625	2,609	5.84	6.23
Mar.	20,558	1,571	7.64	16,048	893	5.56	17,926	1,144	6.38	6.53
Apr.	7,705	397	5.15	4,309	250	5.80	5,669	527	9.29	6.75
May	9,299	311	3.34	9,714	540	5.55	7,982	258	3.35	4.08
June	11,827	418	3.44	11,082	262	2.35	9,285	351	3.78	3.19
July	19,552	689	3.52	19,926	554	2.78	25,769	597	2.31	2.87
Aug.	45,278	1,627	3.58	55,818	1,435	2.57	39,171	976	2.48	2.87
Sept.	158,233	3,885	2.45	129,565	2,972	2.29	166,475	2,990	1.23	1.99
Oct.	281,676	9,495	3.37	219,968	4,715	2.14	224,852	4,839	2.15	2.55
Nov.	305,646	10,087	2.30	216,462	6,622	3.05	237,875	5,724	2.40	2.58
Dec.	181,483	7,678	4.23	152,923	5,060	3.38	171,560	5,158	3.00	3.53
Total	1,272,471	49,043	3.85	1,035,322	34,179	3.30	1,059,147	29,951	2.82	—

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Further reference to the table will reveal three interesting facts: (1) The number of positive reactions showed a gradual decline during the three years under review. (2) The months of February, March and April showed a higher percentage of positive reactions each year than was recorded in any other month. The writer attributes this phenomenon to the fact that in many cases pullorum disease has been noted on the farms during the hatching season and the test applied for the first time, with the result that an abnormal number of positive reactions are recorded. (3) The comparatively low percentages of positive reactions recorded in the early part of the testing season (*viz.*, July to September) reflects the fact that at this time breeders and hatcheries who have been singularly free from pullorum infection for many years are commencing their testing operations with the result that few positive reactions are recorded.

It is the writer's firm opinion that the tube test for the presence of *S. pullorum* infection is gaining in popularity, but such popularity will only be increased so long as the test is maintained at its present high state of efficiency.

The writer would like to express his thanks to both Mr. N. Dobson, M.R.C.V.S., of the Ministry of Agriculture's Laboratory, Weybridge, and also to Professor T. Dalling, M.R.C.V.S., lately Veterinary Superintendent, Wellcome Physiological Research Laboratories, Beckenham, for their interest from time to time in co-operating with tests in certain peculiar circumstances. This collaboration among workers is of the utmost value, especially when it is remembered that so much depends on the accuracy, efficiency and promptness of the test.

THE DOUBLE INTRADERMAL TEST (HOLTHUM'S TECHNIQUE) AS AN ADDITIONAL AID IN THE DIAGNOSIS OF CONTAGIOUS ABORTION.

By T. LE Q. BLAMPIED, F.R.C.V.S., *Jersey*,
AND
A. A. MACKAY, *late of The Laboratory, Goring.*

THIS work was begun because one of us (T. le Q. B.), who had been associated with the late A. W. Holthum in 1927, had formed a very favourable opinion of the test. It was found to be of exceptional value where one was endeavouring to eradicate the disease from a herd containing individuals whose serum furnished what might be called an "indefinite" reaction to the agglutination test. By the application of the intradermal test to such an animal it had been possible to state within a few days whether it was or was not infected. This enabled the owner to remove an infected animal from the herd at least three or four weeks sooner than would have been the case had the agglutination test only been available.

In this short note a record is given in tabular form of tests carried out on 162 animals in eleven herds by the following members of the veterinary profession : Messrs. T. le Q. Blampied, A. Messervy, A. le Sueur, E. S. Paterson, J. McKerlie, and Major J. J. Dunlop. In every case the test was controlled by an agglutination test carried out simultaneously or a few days previously.

The intradermal antigen was prepared from the strain " P.H." of *Br. abortus* Bang, obtained from the Ministry of Agriculture in 1932, and since sub-cultured aerobically on agar at monthly intervals. The technique followed (identical with that devised by Holthum) was briefly as follows :

Fresh sub-cultures were made on agar slopes (Ph 7.8) and these were incubated for seventy-two hours at 37° C. They were then allowed to stand in a dark cupboard for twelve days at room temperature. The growths were emulsified into a thick suspension with 0.5 per cent. carbolic acid in 0.75 saline solution. The suspension was heated in a water bath at 65° C. for thirty minutes in order to ensure the death of the organisms. Subcultures on agar and broth were made and incubated for forty-eight hours at 37° C. to prove sterility of the suspension, which was afterwards standardised to correspond with Tube 10 of Brown's Standard Opacity Tubes.

Technique of the Intradermal Injection.

The neck was selected for the intradermal injections and the initial sensitising dose was 0.2 c.c. A second (diagnostic) injection was made at the same site forty-eight hours later. The measurements of the skin were made with a pair of calipers graduated in millimetres, and a light but steady pressure was used until the calipers were withdrawn from the fold. In making the injections, a syringe of the type used for the double intradermal tuberculin test was employed.

As stated above, in all cases the double intradermal test was controlled by an agglutination test. Three dilutions of serum and antigen were set up in every case, *viz.*, 1 in 10, 1 in 25 and 1 in 50. The tests were incubated for forty-eight hours at a temperature of 37° C., and readings taken at the twenty-fourth and forty-eighth hour.

In recording these results four degrees of agglutination were distinguished, *viz.*, ++++ (complete), +++ (advanced), ++ (distinct), and + (appreciable). In the tables on the following pages the reading at the forty-eighth hour is given in all cases.

Our thanks are due to Mr. H. P. Hamilton, B.V.Sc. (Tor.), Director, the Laboratory, Goring, who freely placed at our disposal facilities for the preparation of the intradermal antigen and for the carrying out of the numerous agglutination tests. Also to those members of the profession referred to above for their kind co-operation in collecting the samples of blood and carrying out the intradermal tests.

TABLE I. (A.M.)

Animals No.	Date.	Agglutination Test. Dilution of Serum and Antigen. 1/10	1/25	1/50	Result.	Intradermal Test. Measurement in mm. Initial.	48 hr.	72 hr.	Result.
B1	Oct. 17, 1935	—	—	—	—	6	8	9	—
B2	,,	—	—	—	—	5	6	7	—
B3	,,	—	—	—	—	7	8	10	—
B4	,,	++	—	—	—	4	6	7	—
B5	,,	—	—	—	—	5	6	7	—
B6	,,	—	—	—	—	6	7	9	—
B7	,,	—	—	—	—	6	8	9	—
B8	,,	—	—	—	—	5	6	7	—
B9	,,	—	—	—	—	4	6	7	—
B10	,,	—	—	—	—	6	18	23	+
B11	,,	++++	++++	++++	+	6	18	Destroyed before 72 hr.	+
B12	,,	—	—	—	—	6	7	8	—
B13	,,	—	—	—	—	5	6	7	—
B14	,,	—	—	—	—	7	8	9	—
B15	,,	—	—	—	—	6	8	9	—
B16	,,	—	—	—	—	4	6	6.5	—
B17	,,	—	—	—	—	5	6	7	—
B18	,,	—	—	—	—	6	7	8	—

It will be observed from the above table that while B10 gave a positive result to the intradermal test, an agglutination test carried out simultaneously was entirely negative.

Three months later (January 8th) a sample of blood (B) was received from this practitioner and was submitted to the agglutination test with the following result: 1/10 ++++, 1/25 ++++, 1/50 ++++. Some weeks later a letter (dated January 29th, 1936) was received from the practitioner, of which the following is an extract: "On October 14th, 1935, I sent you 18 blood samples labelled B1 to B18 which on your agglutination testing gave one positive (B11). At the same time these 18 animals were intradermally tested, and two animals (B10 and B11) gave definite reactions. On January 8th, 1936, I sent you a blood sample "B" (being blood from B10 of the October 14th lot) which you now returned as *positive*. Now this is very interesting as it goes to show an earlier positive reaction to the intradermal test.

This letter was the first intimation received at the laboratory that the 18 animals in question had been submitted to the intradermal test, the material having been obtained from another practitioner in the Island.

No. B11 was destroyed on receipt of the agglutination test report (before the seventy-second hour measurements could be taken) in compliance with the Acts and Orders regarding contagious abortion in force in the Island of Jersey.

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TABLE II. (E. S. P.)

Animals No.	Date.	Agglutination Test. Dilution of Serum and Antigen. 1/10	1/25	1/50	Result.	Intradermal Test. Measurement in mm. Initial.	48 hr.	72 hr.	Result.
1	March 3, 1936	++++	++++	++	+	6	10	14	+
2	„	++++	—	—	—	7	8	10	—
3	„	++++	++++	++++	+	5	18	28	+
4	„	++++	++++	++++	+	5	12	17	+
5	„	++++	++++	++++	+	5	6	12	+
6	„	++	++++	++++	+	4	12	18	+
7	„	++++	++++	++++	+	6	16	23	+
8	„	—	—	—	—	5	7	8	—
9	„	++++	++++	++++	+	5	24	27	+
10	„	++++	++++	++++	+	7	8	10	—
11	„	++++	++++	++++	+	6	16	26	+
12	„	++++	+++	+	+	5	18	21	+
13	„	++++	++++	++++	+	6	14	24	+
14	„	++	—	—	—	6	8	8	—
15	„	+++	+++	++++	+	5	12	17	+
16	„	+++	—	—	—	5	7	11	—

It was decided to retest Nos. 2 and 10 by both methods. The retests were carried out on May 6th, with the result set out below. In the case of No. 2, the swelling at site of injection was circumscribed and painless; in No. 10, œdematous and painful.

Animals No.	Date.	Agglutination Test. Dilution of Serum and Antigen. 1/10	1/25	1/50	Result.	Intradermal Test. Measurement in mm. Initial.	48 hr.	72 hr.	Result.
2	May 6, 1936	++++	+++	—	+	5	9	10	+
10	„	++++	++++	++++	+	6	12	14	+

TABLE III. (T. LE Q. B.)

Animals No.	Date.	Agglutination Test. Dilution of Serum and Antigen. 1/10	1/25	1/50	Result.	Intradermal Test. Measurement in mm. Initial.	48 hr.	72 hr.	Result.
1	April 1, 1936	—	—	—	—	4	5	5	—
2	,,	—	—	—	—	6	7	7	—
3	,,	—	—	—	—	5	6	6	—
4	,,	—	—	—	—	5	6	6	—
5	,,	—	—	—	—	5	6	6	—
6	,,	—	—	—	—	6	7	7	—
7	,,	—	—	—	—	4	6	6	—
8	,,	++++	—	—	—	5	6	6	—
9	,,	—	—	—	—	6	7	7	—
10	,,	—	—	—	—	5	7	9	—
11	,,	—	—	—	—	5	6	6	—
12	,,	—	—	—	—	5	6	6	—
13	,,	++++	—	—	—	5	6	6	—
14	,,	—	—	—	—	5	7	8	—
15	,,	—	—	—	—	5	7	8	—
16	,,	—	—	—	—	5	6	7	—
17	,,	++	—	—	—	5	12	16	+
18	,,	—	—	—	—	5	6	7	—
19	,,	—	—	—	—	5	6	6	—
20	,,	—	—	—	—	5	7	8	—
21	,,	—	—	—	—	6	7	7	—
22	,,	—	—	—	—	5	6	6	—
23	,,	—	—	—	—	6	7	7	—
24	,,	—	—	—	—	6	7	7	—
25	,,	—	—	—	—	6	7	7	—

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26	April 1, 1936	+++	—	—	—	6	7	7	—
27	,,	—	—	—	—	5	6	6	—
28	,,	—	—	—	—	5	6	6	—
29	,,	—	—	—	—	6	7	7	—
30	,,	—	—	—	—	6	7	7	—
31	,,	—	—	—	—	5	6	6	—
32	,,	—	—	—	—	5	6	6	—
33	,,	—	—	—	—	5	7	8	—
34	,,	++++	+?	—	—?	4	5	5	—
35	,,	—	—	—	—	6	7	7	—
36	,,	—	—	—	—	6	7	7	—
37	,,	—	—	—	—	5	6	6	—
38	,,	—	—	—	—	5	6	6	—
39	,,	—	—	—	—	5	6	6	—
40	,,	—	—	—	—	5	6	6	—
Bull 41	,,	—	—	—	—	8	9	9	—
Bull 42	,,	++++	—	—	—	8	9	9	—
43	,,	—	—	—	—	5	6	6	—
Bull 44	,,	—	—	—	—	8	9	9	—
45	,,	+++	—	—	—	6	7	7	—
46	,,	—	—	—	—	5	6	6	—
47	,,	++++	—	—	—	5	6	6	—

This herd consisted of 23 cows, 21 heifers and 3 bulls. Only one case of abortion had occurred in this herd (No. 10, which slipped calf January 27th, 1936, to mating of October 9th, 1935).

It will be observed that No. 17 gave a very definite reaction to the intradermal test. A retest of its blood a month later (May 5th, 1936) gave the following result: 1/10 ++++, 1/25 +++, 1/50 +?

Since this article was submitted for publication (Dec., 1936) the sera of ten of the above animals (Nos. 2, 6, 8, 11, 14, 16, 26, 35, 36 and 44) was subjected to the agglutination test with entirely negative result.

TABLE IV. (J. J. D.)

Animals No.	Date.	Agglutination Test. Dilution of Serum and Antigen. 1/10	1/25	1/50	Result.	Intradermal Test. Measurement in mm. Initial.	48 hr.	72 hr.	Result.
1	April 6, 1936	—	—	—	—	7	9	10	—
2	,,	—	—	—	—	6	7	9	—
3	,,	—	—	—	—	6	8	9	—
4	,,	—	—	—	—	5	8	9	—
5	,,	—	—	—	—	5	7	9	—
6	,,	—	—	—	—	7	8	9	—
7	,,	—	—	—	—	8	10	10	—
8	,,	—	—	—	—	6	8	9	—
9	,,	—	—	—	—	7	9	10	—
10	,,	—	—	—	—	6	8	9	—
11	,,	—	—	—	—	7	7	8	—
12	,,	++++	++++	++++	+	7	24 hrs. 18	Destroyed	+
13	,,	++++	++++	++++	+	5	24 hrs. 10	Destroyed	+

TABLE V. (J. J. D.).

Animals No.	Date.	Agglutination Test. Dilution of Serum and Antigen. 1/10	1/25	1/50	Result.	Intradermal Test. Measurement in mm. Initial.	48 hr.	72 hr.	Result.
1	April 30, 1936	++++	++++	++++	+	7	15	18	+
2	,,	++++	++++	++++	+	7	16	18	+
3	,,	—	—	—	—	6	10	12	—
4	,,	—	—	—	—	7	10	10	—
5	,,	++++	—	—	—	5	8	10	—

6	April 30, 1936.	++++	—	—	—	6	11	20	+
7	"	++	—	—	—	8	14	20	+
8	"	—	—	—	—	7	14	14	—
9	"	++++	++++	++++	+	6	16	30	+
10	"	—	—	—	—	5	13	22	+
11	"	++++	—	—	—	5	8	10	—
12	"	++++	—	—	—	7	10	10	—
13	"	++++	++++	++++	+	6	10	16	+
14	"	++++	++++	++++	+	7	7	10	—
15	"	++++	—	—	—	7	9	12	—
16	"	++++	++++	++++	+	8	20	20	+
17	"	++++	+	—	+?	5	20	40	+
18	"	++++	++++	++++	+	9	18	20	+
20	"	++++	++++	++++	+	5	11	14	+
21	"	++++	++++	++++	+	8	12	14	+
22	"	++++	++++	+++	+	8	11	14	+
23	"	++++	++++	++++	+	6	13	16	+
24	"	—	—	—	—	7	9	12	—
25	"	++++	—	—	—	6	10	14	+
26	"	++++	++++	++++	+	7	14	24	+
27	"	—	—	—	—	6	8	10	—
28	"	—	—	—	—	6	9	18	+
29	"	++++	++++	++++	+	6	9	18	+
30	"	++++	+++	—	+	9	11	14	+
31	"	++++	—	—	—	7	10	18	+

TABLE V. (J. J. D.) (*continued*)

Animals No.	Date.	Agglutination Test. Dilution of Serum and Antigen 1/10	1/25	1/50	Result.	Intradermal Test. Measurement in mm. Initial.	48 hr.	72 hr.	Result.
32	April 30, 1936	++++	++++	++++	+	5	13	22	+
33	,,	+++	—	—	—	8	13	34	+
34	,,	—	—	—	—	7	10	12	—
35	,,	—	—	—	—	7	12	24	+
36	,,	++	—	—	—	5	8	12	+
38	,,	++++	++++	++++	+	5	10	12	+

In view of the above results it was decided to retest Nos. 6, 7, 8, 10, 14, 33 and 35. This retest was carried out on June 5th, and the result set out below.

Animals No.	Date.	Agglutination Test. Dilution of Serum and Antigen. 1/10	1/25	1/50	Result.	Intradermal Test. Measurement in mm. Initial.	48 hr.	72 hr.	Result.
6	June 5, 1936	++++	++++	++++	+	7	18	34	+
7	,,	++++	++++	++++	+	8	17	32	+
8	,,	++++	++++	++++	+	7	14	20	+
10	,,	++++	++++	++++	+	7	20	48	+
14	,,	++++	++++	++++	+	7	10	11	—
33	,,	++++	++++	++++	+	8	22	40	+
35	,,	++++	++++	++++	+	6	16	16	+

The above would suggest that the intradermal test had succeeded in revealing six infected animals thirty-six days earlier than the agglutination test. However, it was learned that since the test of April 30th, all the members of this herd had been vaccinated with "an emulsion in carbolised saline of cultures of recently isolated *Brucella abortus* which had been killed by heat." Each c.c. contained 3,000 million organisms, and two doses were given at seven-day intervals, *i.e.*, 5 c.c. followed by 10 c.c.. A "heat-killed sterility" vaccine had also been injected into these animals.

In the case of No. 14, it would appear that the intradermal test has failed to provoke a reaction on either occasion.

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TABLE VI. (J. J. D.).

Animals No.	Date.	Agglutination Test. Dilution of Serum and Antigen. 1/10	1/25	1/50	Result.	Intradermal Test. Measurement in mm. Initial.	48 hr.	72 hr.	Result.
1	May 1, 1936	—	—	—	—	5	7	8	—
2	,,	—	—	—	—	7	10	12	—
3	,,	—	—	—	—	5	9	12	—
4	,,	—	—	—	—	5	8	12	—
5	,,	++	—	—	—	5	8	12	—
6	,,	—	—	—	—	5	7	9	—
7	,,	—	—	—	—	4	7	9	—
8	,,	—	—	—	—	5	8	10	—
9	,,	—	—	—	—	7	8	14	—
10	,,	++++	++++	++++	+	5	14	22	+
11	,,	++++	—	—	—	5	7	12	—
12	,,	—	—	—	—	6	7	9	—
13	,,	—	—	—	—	5	7	10	—
14	,,	—	—	—	—	5	7	8	—
15	,,	—	—	—	—	5	7	9	—
16	,,	++++	—	—	—	6	8	9	—
17	,,	—	—	—	—	5	8	9	—
18	,,	—	—	—	—	7	8	10	—
19	,,	—	—	—	—	4	7	8	—
20	,,	++	—	—	—	5	8	8	—
21	,,	++++	++++	++++	+	5	11	15	+
22	,,	—	—	—	—	6	10	20	+
Bull 24	,,	++	—	—	—	12	14	16	—

It was decided to retest No. 22 by both methods in four weeks, with the following result :

Animals No.	Date.	Agglutination Test. Dilution of Serum and Antigen. 1/10	1/25	1/50	Result.	Intradermal Test. Measurement in mm. Initial.	48 hr.	72 hr.	Result.
Retest 22	June 8, 1936	++++	++++	++++	+	8	22	36	+

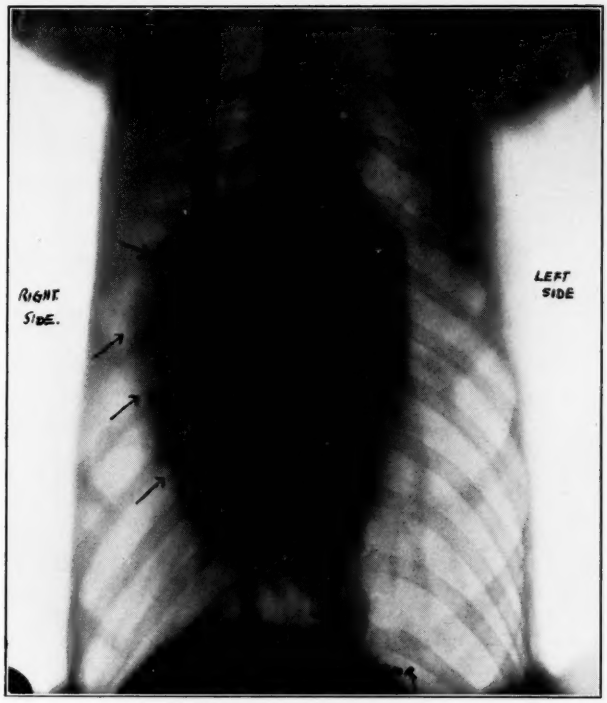
TABLE VII.

Animals No.	Date.	Veterinary Surgeon.	Agglutination Test. Dilution of Serum and Antigen. 1/10	1/25	1/50	Result	Intradermal Test. Measurement in mm. Initial	48 hr.	72 hr.	Result
57	Oct. 13, 1935	T. le Q. B.	++++	+	—	+ ?	6	6	6	—
40	Nov. 1, 1935	„	++++	+++	++	+	9	17	26	+
1	Oct. 25, 1935	J. McK.	++++	+++	—	+ ?	8	10	11	—
36	Feb. 14, 1936	E. S. P.	++++	++++	++++	+	5	12	16	+
E1	May 1, 1936	J. J. D.	++++	++++	++++	+	5	14	20	+
E2	„	„	++++	++++	++++	+	7	11	18	+
23	April 1, 1936	„	++	+++	++++	+	6	12	20	+
19	Mar. 25, 1936	„	—	—	—	—	7	18	28	+
37	„	„	—	—	—	—	6	10	15	+
38	April 1, 1936	T. le. Q. B.	++++	+ ?	—	— ?	6	7	7	—
38 (retest)	May 4, 1936	„	++++	++++	+++	+	6	8	10	—
19 (retest)	June 5, 1936	J. J. D.	++++	++++	++++	+	8	24	36	+
37 (retest)	„	„	++++	++++	++++	+	5	9	15	+

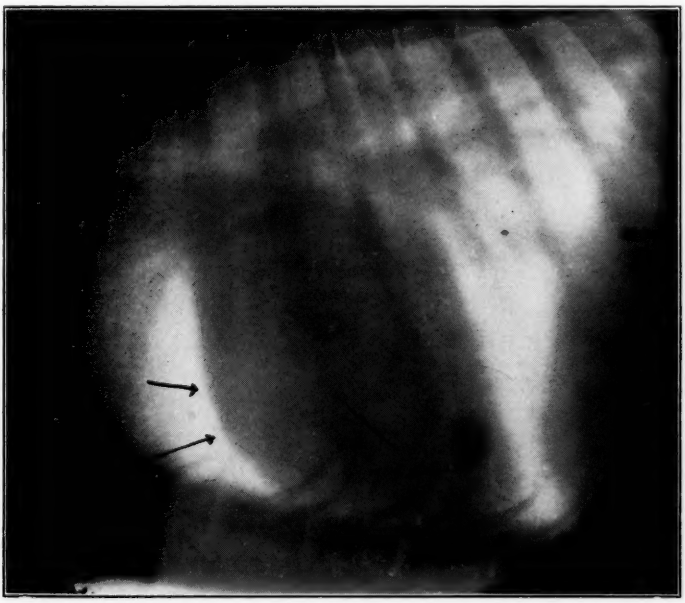
No. 57 was retested by the agglutination method after four weeks with identical result.

Nos. 19 and 37 both aborted after the negative agglutination test on March 25th. When subsequently retested by this method on June 5th, several dilutions of serum and antigen were employed to find the end-point of reaction. This was found to be 1/1600 in both cases, but no higher dilution was employed.

No. 1 was retested with negative result, except in a dilution of 1/10, one month later.



Case 1.—Dorso-ventral view showing marked bulging of right side of heart into right half of chest.



Reference Case 1.—Lateral view of heart showing marked bulging of right ventricle in lower two-thirds of anterior wall.

(*Article by* J. McCunn and H. J. Ede, F.S.R., *page* 191)

Case 2.—Picture No. 1, showing what might be mistaken for a normal hip joint.

Case 2.—Picture No 2, showing obvious dislocation and filling of acetabulum.

(*Article by* J. McCunn and H. J. Ede, F.S.R., *page* 191)

Clinical Articles

Parasitic Enteritis in a Mare.

By RICHARD HUDSON, F.R.C.V.S.
Retford.

THE subject was a six-year-old shire mare, in foal; had been at grass all the winter, and having a feed of chop and corn in the field. She was found refusing to feed, and lying about, but showed no colic pains. She was in fair condition : her coat was dull, and she looked a worm case, but none could be found in her dung.

Symptoms.—Pulse 90–100, temperature 106° F., respirations very rapid; mucous membranes only slightly infected. I suspected a patch on her lungs, but could not locate it; occasionally I thought I detected the rubbing of pleurisy, but the sound did not persist. For a day or two she did not lie down, and then she did and rested normally.

After the first day her appetite returned and she fed fairly well, taking scalded bran and chop, mangolds and hay. Her temperature and pulse remained high for about a week and then fell gradually, until in a fortnight, pulse, temperature and respirations were practically normal. They remained normal for three or four days and then the acute symptoms suddenly returned, and it was evident that she would soon die.

The post-mortem examination showed peritonitis with lymph deposits and a large quantity of opaque pink (bloody) liquid. The wall of the large colon was thickened throughout to the extent of three-quarters of an inch, the mucous membrane being swollen and congested. Parasitic emboli were found at the cœliac axis and along the vessels of the colon; very few worms, *S. vulgaris*, were found in the colon and cæcum, and none had been found in her fæces, although it had been regularly examined. The thorax contained a quantity of fluid similar to that in the peritoneum.

The fluids in the womb were like porridge, but the foal did not appear to have been dead long, there being no post-mortem changes in it outwardly. The lungs showed no pneumonic lesion. They were about the healthiest organs she had.

Treatment.—At the onset, camphor pot. nit., ammon. carb., later strychnine hypodermically and in drinking water.

Remarks.—For a case where peritonitis and pleurisy probably existed at the onset, it appears unusual not to have pain shown by pawing, and a tendency to lie and to be uneasy when down; nor does one expect the bowels to be normal in action. When no cough, expectorant, or smelly breath came along I abandoned

my pneumonia diagnosis, though I still held to pleurisy, but the fluid in her chest was not sufficiently high to be detectable. The absence of worms in the fæces may not be unusual. They may have been present some time, perhaps years before, and some emboli in the blood vessels also.

Hæmorrhagic Enteritis Simulating Milk Fever in the Cow.

By RICHARD HUDSON, F.R.C.V.S.

Retford.

ONE is apt to take it for granted that a cow unable to rise a few days after calving is a milk-fever case, and 90 per cent. are, but the others are the ones which let us down and sometimes not lightly.

The subject was a pure-bred dairy shorthorn at her third calving, very fat; but having been at grass all the winter, the owner explained that she was not expected to " go down." She had not had much concentrated food, only a feed when she came into the yard at night along with others. She was a good milker, but very little had been obtained since she calved.

She was found in the field about to calve and brought in. Calving was normal, and the following morning she was found down and could not rise. The owner —one of the knowing kind—inflated her udder, and during the day she made several attempts to get up but could not. The owner thought her better than in the morning, but not being satisfied called me in the evening.

I found her lying in the gutter of the cowhouse. She was conscious and occasionally tried to rise, but made a poor effort. Respiration and temperature were about normal, but her pulse was about 90 per minute, small and hard. There was no evidence of diarrhœa or passage of fæces. The case looked like one of milk-fever paralysis, though her pulse made me suspicious that my diagnosis might be wrong.

I do not like to repeat an inflation after an owner has had a go, preferring him to have the credit of setting up mastitis; neither do I like giving intravenous injections when the pulse is fast, fearing that calcium may cause heart block. However, as my solution was dilute, I thought she would stand it. Calcium chloride (crystals), 1 oz.; magnesium chloride, 2 drams; water, 24 oz., was injected per jugular slowly, and the injection was received as in a normal case. She was well rugged and made comfortable.

About four hours later the owner rang up and said she was very restless, and when he returned he did not like the look of her, so sent for the butcher and killed her.

The post-mortem examination showed the carcase very red in the subcutaneous fat. It appeared to have been insufficiently bled. The liver was enlarged, the lungs congested and showing some œdema in the septa. The small intestines,

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opened here and there, showed enteritis with bloody contents. All the other organs appeared healthy.

Remarks.—A cow out in the field all the day and brought into a wet yard along with others at night is not very closely observed, and she may not have been well at the time she calved. The weather being very wet at the time, exposure may have induced a chill and enteritis of a type sufficiently severe to postrate her, which was really her condition when I saw her, and not milk fever.

A Note on Aids to Diagnosis.

By J. McCUNN and H. J. EDE, F.S.R.

Royal Veterinary College.

It is to be noted in these modern times, and in all walks of life, that there is engendered an increasing tendency to seize upon new methods or inventions as an aid, help or alternative to labour, physical or mental. In no sphere has this new factor been better marked than amongst those whose work includes the art of diagnosis.

The man who pioneers, or makes use of the many gifts of modern science, is one to be lauded and encouraged. He must, however, remember that in spite of the apparent infallibility of science and the machine, the human element is still the essential factor in the search for truth. In matters veterinary, probably the most important advance of modern times is the use to which the X-rays have been put as an aid in diagnosis. In this branch of our activities it is well to sound a note of warning—we must not let the X-ray usurp our duties. The machine depicts, but man must interpret the findings.

If we adopt this attitude it is possible to gain great help and avoid many pitfalls. The object of this article is to stress the above points, and it is proposed to quote two cases, in one of which diagnosis was considerably assisted, and in the other the opposite might have ensued.

Case No. 1.

Subject.—A racing greyhound dog, aged four years.

History.—It was quite well on Saturday, April 24th, 1937. It ran in a 725 yards race, and although interfered with, it went through the rest of the field and won its race, finishing strong. On Tuesday, 28th, over a similar course and distance it broke well, had a clear run, but only finished second. It seemed to the onlookers to lack its usual vim. After this race it was blowing for nearly an hour. It had a slight cough and appeared to be trying to clear its throat. Its temperature was not taken immediately, but about five hours afterwards it was 98.3° F. During the following day the temperature remained low. It was keen for food, but was kept on a light fish diet. It was brought for examination on April 29th, 1937. On examination the dog was seen to be in good bodily condition, but it

had a dull appearance. There was slight cyanosis of the tongue and mucous membranes. There was a darker area along the alveolar margin of the gums. Some heart lesion was suspected. There was a very distinct thrill over the heart, and the apex beat was at the eighth rib. The impulse was irregular and intermittent, as was also the pulse. Further, the pulse was of the water-hammer variety. The superficial veins were distended. On auscultation the second sound was very loud and sharp. The first sound was soft by comparison, and over the aorta and right ventricular area a systolic murmur was heard, which was continued into the short pause. It was possible to appreciate this murmur over the carotid and femoral arteries. As no gallop was available the dog was tested by being run up three flights of stairs. This was repeated twice. The abnormal heart sounds, especially the aortic one, were accentuated, and the cyanosis increased immediately after this test.

A diagnosis was made of strained heart with dilatation of the right side, and of the aorta just beyond the valve. It was decided to X-ray the animal, and the plate illustrating this article demonstrates the excessive bulging of the right heart.

Case No. 2.

Subject.—A black cocker spaniel.

History.—Was injured on February 27th, and subsequently was lame in the near hind.

It was presented for examination on April 27th, 1937. It was lame in near hind limb. There was considerable wasting of the muscles of the thigh and buttocks. There was a lump over the right hip-joint, which did not disappear when the femur was abducted. There was a little pain on manipulation and some movement of the head of the femur. The movement was accompanied with slight grating such as is associated with fracture of the acetabulum, or rupture of the ligamentum teres. It was resolved to confirm by X-rays. This X-ray demonstrated some thickening of the bone of the acetabulum and around the latter. The X-rays did not show a dislocation, and consequently did not agree with the clinical findings. We were so positive that there was a dislocation that a further X-ray picture was taken at a slightly different angle. This time there was no doubt as to a dislocation being present and, further, the acetabulum was shown to be partly filled up by new bone.

Observations.

Case 1 is quoted as illustrating the value of the X-rays, and case 2 as one in which, if one had entirely depended upon the X-rays, a definite diagnostic error would have occurred.

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Mercurial poisoning in the horse.

(*Abstract of article by* Dr. R. Pico, *page* 193)

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Abstracts of Current Literature

An Interesting Case of Mercurial Poisoning in the Horse. By Dr. R. Pico, *Clinica Veterinaria*, 1936, No. 6, page 101.

For the treatment of distortion of the fetlock joint in a seven-year old Percheron, the author prescribed interspaced friction with a small quantity (6 drachms) of the following ointment: biniodide of mercury ointment 2, in 3 of Hg. ciner simplex. The ointment was used all at once by the owner. After three days the horse was no longer lame, but a big diffuse swelling arose in the fetlock and metacarpal region, which declined after a few days. The lameness recurred, at first without other noticeable clinical signs, but after three weeks a fluctuating swelling as big as one's fist appeared in the upper shoulder region. Puncture caused a continued spurting of blood without the swelling declining in size; at the end of a month the whole of the external shoulder muscles swelled and the spine of the scapula sank in the swelling. Since the condition became worse the practitioner made an incision and digital exploration. Uncontrollable bleeding immediately ensued. The blood cavity was located under both shoulder muscles; the lateral surface of the shoulder blade appeared porous; the flow of blood from numerous perforations in the bone was plainly recognisable with the finger. The patient was eventually slaughtered.

Post-mortem revealed a great hæmorrhagic infarction in the left kidney and in the liver. The shoulder blade was thinner than normal and perforated throughout, as may be seen in the plate illustrating this note.

The pathological finding in this case is not clearly explainable as a pure toxic result, since the general condition of the patient always remained good. The author surmises that little drops of mercury circulated freely in the blood stream, and that the endothelium of the vessels of the left shoulder-blade, as well as that of the liver and left kidney, was eaten away.

Ascaridia in Pigeons. By Dr. Baudet. *Tdschrft. v. Diergen.*, Feb., 1937.

Summary.

A great difficulty in administering medicaments to pigeons, either in capsules or in liquid, is that they easily vomit, especially when there is still some food in the crop. Therefore it is strongly advised not to start treatment before a preliminary fasting, though even this does not always avoid vomiting.

The author has studied the effect of various medicaments against ascaris (*Ascaridia columbæ*): carbon tetrachloride, tetrachlorethylene, oleum chenopodii, kamala in combination with nicotine sulphate, ascarioline (containing Santonin

and calomel), ascaridol oil (contains the efficacious constituent from oil chenopodii), hexylresorcinol, turpentine.

The best appeared to be oil chenopodii. Also carbon tetrachloride yielded rather good results; tetrachlorethylene appeared inefficacious against ascaris of the pigeon. None of these three medicaments had any effect upon capillaria. Ascaridol oil, provided that it is administered in capsules and followed by a laxative, gave rather good results, but the drawback is that at least two to four capsules should be given and that more than one treatment is required.

The other medicaments mentioned failed to expel ascaris, even after repeated treatment.

Reviews

Practical Veterinary Pharmacology, Materia Medica and Therapeutics. By H. J. Milks, D.V.M. Third Edition. London: Baillière, Tindall & Cox. Price 30s.

When a veterinary text-book on Practical Veterinary Pharmacology has reached its third edition, and is still going strong, it is quite evidence enough that it must find a useful place not only as a text-book for the student, but also as a book of reference for the practitioner; and a text-book by Dr. Howard J. Milks, together with its addendum on biological therapeutics by such an authority as Dr. Adolf Eichhorn, can well be said to come within this category. Every part of modern veterinary pharmacological therapeutics is dealt with, and there are chapter on practical dispensing, prescription writing and the methods of administration of drugs, which give a groundwork to the junior student for examination purposes, whilst pharmacological actions of various drugs as applied to therapeutic uses are taken in full detail. This part of the book, occupying some 497 pages, is brought fully up to date. The chapter on biological therapeutics by Dr. Eichhorn occupies some fifty pages, and is extremely interesting reading. The subjects of immunity, with the uses of vaccines and sera against preventive or diagnostic or curative treatment, deals with the latest up-to-date methods used to combat anthrax, canine distemper, blackleg, abortion, equinine influenza, hog cholera, rabies, tetanus, white scour tuberculosis and glanders, together with chapters on fowl pox and hæmorrhagic septicæmia. This book should be in every practitioner's library.

The Lymphatic Glands. Jointing of Carcases and Animal Anatomy. Drawings for Students of Meat Inspection. By James Goodfellow.

This small book, which is now in its second edition, will no doubt be of considerable value to lay inspectors studying for the certificate of the Royal Sanitary Institute. It is very elementary and the drawings are crude, and therefore of little or no value to the veterinary surgeon, whose thorough knowledge of animal anatomy goes far beyond the scope of this book; nevertheless, we recommend it to the students for which the book has been written.

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Correspondence

SKIN TUBERCULOSIS IN CATTLE.

To the Editor of THE VETERINARY JOURNAL.

SIR,—*Re* Dr. Brook's article, THE VETERINARY JOURNAL, April, 1937.

This condition is of fairly frequent occurrence in Great Britain, but I suppose on account of its local condition and non-pathogenic character it has not been recorded. I can recall at least eight cases in my own practice during the last four years. If readers of this article would do the same, I have no doubt that in the aggregate the cases would amount to a considerable number, and the distribution would be fairly general.

These nodules, which are enclosed in a tough capsule, contain a whitish or slightly yellow pus, which may or may not include a calcareous matrix. In my opinion they are similar to the huge pus-containing swellings one finds occasionally in the pre-scapular and pre-crural glands. These are due to the Preisz-Nocard bacillus. They are not usually found in the internal lymphatics, but are occasionally encountered in the mediastinals and in recorded cases in the heart (Watson: Mid-west and South Wales division, some four years ago).

One case may still be in existence. A big shorthorn cow with several of these swellings on the off hind fetlock and shin similar to the one shown in the photograph of the Friesian cow. I have known this cow for at least six years during my routine inspections (now, alas, taken over by whole-time service) of dairy cows, and there was never any change in the case from year to year. I have seen the condition in chain formation on the neck, shoulders, forearm, hindquarters, as well as on the shin and fetlock.

I suggest that these lesions are due to the Preisz-Nocard bacillus, and come under the heading of pseudo-tuberculosis. They are not recognised as being tuberculous.—I am, Sir, yours faithfully,

J. W. HALL MASHETER.

THE "MISS ALEEN CUST" MEMORIAL FUND.

To the Editor of THE VETERINARY JOURNAL.

SIR,—The above fund has been opened to collect money in order to erect a memorial to the late Miss Aleen Cust, to honour her memory as the pioneer woman member of the profession. A number of subscriptions have been received already, and we hope that many more men and women graduates will support the fund. It is hoped that a large amount will be collected so that the memorial erected may be lasting and useful. Subscriptions should be sent to Miss P. L. Williams, 35, Foregate Street, Stafford; or Miss O. B. Woodward, Walpole House, Burton-on-Trent, Staffs.—I am, Sir, yours faithfully,

OLGA B. WOODWARD.

Walpole House,
Burton-on-Trent.
May 5th, 1937.

Personal

THE readers of our Journal will be interested to know that by the Will of the late Miss Cust, M.R.C.V.S., the first woman member of the Royal College of Veterinary Surgeons, the sum of £500 was left at the disposal of the Council for the formation of a scholarship in veterinary research, to be awarded to members or fellows to enable them to prosecute original research in a branch of veterinary science ; and she expressed the desire that if contestants should appear of equal merit, the preference should be given to a woman. She also left £100 to the Royal Veterinary College to endow a kennel at the College in memory of her miniature cocker spaniels, to bear the inscription : " I freely admit that the best of my fun I owe to Horse and Hound." The gross value of her estate was £29,915, with a net personalty of £26,229.

THE veterinary staff of the County of Cheshire, which forms a section of the Public Health Department, and whose formation only commenced in a very small way some five years ago, now consists of one chief and ten district veterinary officers, the number of accredited herds in Cheshire now having increased to 2,448 producers.

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